and perhaps also the palpi, may claim this sense, and finds full confirmation of Dufour's (37) views, and adopts as new the physiological possibility expressed by Hill[1] and Bonnet,[2] that the antennæ might be the seat of both senses—those of smell and hearing.

As for the Crustacea, it was through Huxley,[3] and still more through Leuckart,[4] that the evidence was afforded that Rosenthal's—also adopted as such by Blainville—olfactory organ at the base of the inner antennæ should be regarded as an apparatus of hearing. Huxley therefore thought, following Farre and Robineau-Desvoidy, that the seat of the sense of smell must lie in the organ discovered by Fabricius in the outer antenna, while Leydig,[5] almost at the same time, considered certain pale, minute hairs on the terminal joint of the inner antennæ as specific sense-organs.

The beautiful works of Erichson, Burmeister and Perris could not remain long unnoticed. In 1857 Hicks (47, 48, 49) published complete researches on the peculiar nerve-endings which he had found in the antennæ, also in the halteres of flies and the wings of all the other groups of insects,[6] and which he judged to be for the perception of smell. But Erichson's and Burmeister's "pori" were by Lespès, in 1858 (38), explained to be so many auditory vesicles with otoliths. This view was refuted by Claparède (39) and Claus (13), without their deciding on any definite sense.—*To be continued.*

ZOOLOGY.[7]

REPRODUCTION OF THE VISCERA IN THE FEATHER-STARS.—It has been known for nearly four hundred years that Comatula, a living crinoid, is capable of casting its visceral mass at will, or upon slight irritation, while in 1884 it was shown by Professor A. Milnes Marshall that one species had the power to reproduce the parts thus lost. Mr. Arthur Dendy has recently studied the subject and suggests[8] that since these animals have no selective power over their food supply, this ability to cast out the stomach may be a provision for getting rid of any noxious matter or disagreeable parasite introduced by the ciliary currents. The line of separation takes place between two layers of connective tissue, one of which lines the cup in which the viscera rest while the

[1] *Hill:* Hamburger Magazin, XVII, 391.

[2] *Bonnet:* Contemplation de la Nature, III C, 18.

[3] *Huxley:* On the Auditory Organs in the Crustacea, Ann. and Mag. Nat. Hist. II Ser. Vol. VII, 1851.

[4] *Leuckart:* Ueber die Gehörwerkzeuge der Krebse, Archiv für Naturgeschichte, 1853, I, 255, 304–306, 373–374.

[5] *Leydig:* Ueber Artemia salina und Branchipus stagnalis, Zeits. f. w. Zoologie, III, 1851, 287.

[6] Graber's sketch of our earlier knowledge of the "peg-bearing" organs (the chordotonal sense-organs of insects) pp. 509, 558, 586, are therefore to be corrected n the foregoing sense.

[7] Invertebrata edited by J. S. KINGSLEY, Sc.D., Malden, Mass.

[8] Studles Biol. Laboratories Owens College, Vol. I, pp. 299-312, 1886.

other forms an envelope for the viscera themselves. The viscera thrown off decay while the animal replaces them with new. It would appear that the epithelial lining of the stomach was derived from an invagination of the epidermis of the roof of the visceral basin, while the limiting connective tissue arises from that left behind in the cup. The ambulacral system is also regenerated from the epidermis, and with it the ambulacral nerves. This case is far more interesting than that afforded by star-fishes and brittle-stars, in that while they can restore lost arms or even a part of the visceral mass, Comatula can reproduce the whole of the digestive system.

THE LEECHES OF JAPAN.—Dr. Whitman, in the Proceedings of the American Academy of Arts and Sciences (Vol. xx, 1884) adverted to the poor quality of the work done on the leeches, but his present paper on the leeches of Japan (*Quart. Jour. Micros. Sci.*, XXVI, 1886) is certainly not open to criticism as to carefulness and accuracy. It deals with the species of the family Hirudinidæ, and is illustrated by exquisitely executed colored plates after drawings by a Japanese artist. Besides this it contains some morphological notes and observations on habits which are interesting. Dr. Whitman shows that on each segment of a leech there are certain sense organs which are serially homologous with the eyes, and which besides are somewhat similar to the latter in structure, each possessing the same peculiar large clear cells. What the function of these segmental sense organs is, remains unsettled, but the experiments detailed go to show that they have the power of recognizing the differences between light and darkness, and that they are not concerned with smell or taste. The similarity of these to the lateral line organs of fishes in their early stages is pointed out and the homology of the two suggested.

MYRIAPOD ANATOMY.—Mr. C. G. Bourne publishes in the Journal of the Linnean Society a paper on the anatomy of Sphærotherium, a genus of Myriapods from the Cape of Good Hope, allied to the more familiar Glomeris. Among the more interesting or important points brought out may be mentioned the following: The existence of stridulating organs; the presence of peculiar sense organs on the tips of the antennæ; and the peculiar structure of the tracheal system, which deserves a moment's attention. The tracheæ have the same distribution as the legs, that is, there is a pair in each of the first three pedigerous segments of the body, and in the remainder there are two pairs in each segment. Each stigma opens into a large sac, and from this the spiral-walled tracheal tubes take their origin. The author insists that both here and in Peripatus the opening to the tracheal sac should be regarded as the spiracle and not the opening from the sac into the trachea. The paper also has some notes on a possible organ of hearing.

LEPTODORA IN AMERICA.—The American Society of Microscopists, at its meeting in August, devoted a day to dredging and skimming in Chautauqua lake. The most noteworthy find was a specimen of the beautiful little cladoceran crustacean, *Leptodora hyalina.* This species was previously known in this country only from a single somewhat mutilated specimen recorded by S. I. Smith from Lake Superior. Mr. Charles S. Fellows, however, has taken a few specimens from a lake near Chicago. *Leptodora hyalina* is the largest of its group, reaching a length of an inch.

NERVOUS PHYSIOLOGY OF THE LOBSTER.—Mr. C. F. Marshall has been studying the nervous system of the lobster, and comes to the following conclusions: That the thoracic nerves did not have separate motor and sensory roots, while in the abdominal region the anterior nerve arising from each ganglion was both motor and sensory, and the posterior was sensory alone; the second thoracic ganglion is a special reflex center for the great claw, and that reflex actions were more marked when this ganglion was separated from the brain; and lastly that there is no such marked decussation of nervous fibers in the central cord as exists in vertebrates. This last point will repay farther study, for nervous impulses travel across the ganglia from one side to the other.

MORTALITY OF FISH AT LAKE MILLE LAC, MINNESOTA.—The above lake, lying in the east central part of the State, is about twenty-two miles long and eighteen miles wide. It is, for the most part, very shallow, and consequently during June, July and August its waters are very warm.

Every summer for several years past, after a strong wind has been blowing on shore for a day, the beach is strewn a distance of many miles with thousands of fine fish. Some of these are found just expiring, others but just dead, and others far advanced in decomposition, the latter appearing to have been floating in the water for a long period.

The evident cause of the death of these is the presence of an external parasite, one of the Siphonostomata, which we found swarming on head, operculum and belly. These parasites are translucent, disgusting-looking creatures, about the size and shape of a wood-tick, though many are larger, the abdomen furnished with an umbrella-like disk, which apparently assists them in clinging to their slippery hosts.

The back of the fish, near the head, is the spot most frequently affected, though many specimens were found with large eaten patches on the sides and belly, and the part so attacked had become covered with a brown slime. This in specimens hardly dead, would indicate they had lived some time in a diseased condition.

During five weeks observations in June and July, I found that

among these fish the wall-eyed pike (*Stizostedium vitreum*) was the most abundant, ranging in length from ten inches to two and one-half feet.

There were, too, hundreds of perch (*Perca americana*), rock bass (*Ambloplites rupestris*), black bass, (*Micropterus salmoides*), bull heads (Amiurus) crappies (*Pomoxys annularis*), calico bass (*P. sparvides*) and many other specimens of a variety of white fish (*Coregonus artedi*). Also the "ling" (*Lota maculosa*), an occasional dog-fish (*Amia calva*), many pike (*Esox lucius*), and large suckers.

The warm water of the large lake probably helps to incapacitate the fish, for in the smaller lakes in the vicinity, which are fed by springs, the fish are comparatively free from such enemies.

I might say here I found no sure indication of the muskellunge (*Esox nobilior*) inhabiting Lake Mille Lac. The specimens of so-called "muskellunge" shown me by the farmers were giant specimens of *E. lucius.*—*F. L. Washburn.*

Longevity of Turtles.—The following history is so well authenticated that I believe it should be published, and thus permanently put on record. I am personally acquainted with the principal parties.

In 1824 Mr. J. W. Warrington, one of the pioneer pedagogues of this vicinity, found a small *Testudo carolina* Linn., on the plastron of which he engraved, with his pen-knife, "J. W., 1824" and set it free near Albion, Ill. Some time during 1865 Mr. W. Hodson found it in the same vicinity where it had been set free forty-one years before. He engraved the letter "W" on the carapace and again set it free. Nothing more was seen of it until August, 1885, when it was found by Mr. Herbert Hodson (brother to W.) about one-half a mile from the spot where it had been set free twenty years before. He put it into his cellar where it remained until this (1886) summer, when it by accident was poisoned by "Rough on Rats," and died from the effect. The engravings are all apparently as clear as when first made. The tortoise was below the medium size, and appears to have grown very little since the first engraving was done, sixty-two years since. The shell is darker and smoother than usual. On the back is a scar which appears to be the remains of an extensive fracture. Mr. H. Hodson has three other tortoises that were engraved twenty-one, seventeen and sixteen years since respectively. In illustration of the slow growth of these reptiles, I will mention that more than a year since he broke open an egg in which was found a young tortoise; this he has since kept in confinement. It has made no perceptible progress in size during this time. Several years since I kept a young *Pseudemys elegans* Wied. in confinement for more than two years. It made no perceptible increase in size, yet it partook quite freely of food.—*J. Schneck, Mt. Carmel, Ill., Sept. 22, 1886.*

GAPES IN FOWLS.—The fact that the disease known as gapes in poultry is produced by a parasitic worm (*Syngamus trachealis*) which infests the trachea of the birds was settled long ago, and for most of our recent knowledge of the worm and the disease we are indebted to the prize essay of Pierre Megnin. According to this author the mature worms and their eggs are coughed out of the throat of the infested fowl and the disease is spread by its associates picking them up along with their food or by drinking water in which the eggs may have hatched into larvæ. No suggestion is allowed of any intermediate host. Mr. H. D. Walker, in an apparently carefully prepared paper on this subject (Bulletin Buffalo Society Nat. Sciences, v, pp. 49–71, 1886) details many experiments which he has tried, and several of them point very strongly to the conclusion that the earth-worm may, in many cases, play a part in the distribution of the pest. The embryos have been found living in the earth-worm at all seasons of the year, and earth-worms from infested localities, when fed to chickens, almost invariably produce the disease. Dr. Walker has also produced the disease in robins, and claims to have found the embryo of the lung-worm of calves (*Strongylus micrurus*) in the earth-worm.

PROTRACTED FLIGHT OF A GOLDEN PLOVER.—An instance of remarkably long-protracted flight of a golden plover (*Charadrius virginicus*) came under my personal observation on May 5th, 1885, and is again called to mind by the article on "Gravitation and the Soaring Birds" in the June number of the NATURALIST.

The incident occurred on board the steamship *Oceanic*, bound from San Francisco to Yokohama, on the eighth day out of port and in latitude 37° N., longitude 156° W. For three days a stiff gale had blown from the N. N. W., and abated with fair weather on the morning of the day mentioned. At about 6 P. M. a golden plover was observed perched on the taffrail in a thoroughly exhausted condition, with open bill and drooping wings, having evidently just alighted.

So nearly spent was the bird that he was captured without difficulty and retained as prisoner for several days; but though he ate food supplied him, so great was the strain to which he had been subjected, that on accidentally escaping he fell into the ocean on attempting to fly, and was drowned. At the time his presence was first discovered on board, the ship was 1140 miles from the nearest land, one of the Hawaiian island group, lying to the south. Northerly the nearest land was one of the Aleutian islands, distant 1320 miles, while the nearest continental land was the coast of Alaska, no less than 1500 miles away. In all three of these regions the golden plover lives and breeds. He is also a transient visitor on the Californian coast which we left behind us eight days previously. The question now arises: From which of these localities did our feathered waif hail?

The first casual supposition that he must have been a stow-a-way brought from port, must be acknowledged, on further consideration, as unsupported by fact.

The date of sailing, April 28th, was too late to support the probability of such an origin, all golden plovers having probably migrated from semi-tropical California to their northern breeding grounds at a much earlier date. Then the existence of such a stow-a-way on board, undiscoverd for eight days, was at best improbable; for had starvation not forced an earlier discovery, the numerous cats and dogs on board would have inevitably flushed the bird. The condition of our visitor when discovered, and his ultimate fate, also preclude the possibility of his having traversed by steam power the distance from shore to mid-Pacific.

To have reached us from the southward he must have flown over 1100 miles in the very teeth of a protracted and violent gale, a feat we may well set aside as impossible. One source of origin for our winged visitor alone remains: At the time of his discovery he had certainly just finished a long and utterly exhausting flight.

Far northward on the Alaskan coast he must have been caught by the gale through which we passed, and borne out to sea beyond hope of return, and then swept on and on by the winds till the storm forsook him, perhaps 1500 miles from the spot from whence it tore him. Then after a day's battling against the elements, instinct or chance, or Providence directed his flight toward the only possible goal of refuge, and his wonderful voyage came to an end in the mid-Pacific more than 1300 miles from the nearest possible starting point, after a pauseless flight over this great expanse of waters.

Phenomenal as the occurrence seems, I believe I have expressed the only logical conclusion warrantable by the facts obtainable. Moreover, the latter are to a certain degree supported by another incident observed by me less than three weeks later.

On the evening of May 23d, while a passenger on the Japanese steamer *Higo Maru*, bound from Yokohama to Hakodate, and about twenty miles from the coast of Japan, the snow-covered coast hills of which were plainly visible, a golden plover lighted in a perfectly fresh condition on the davits. On being approached by myself and the captain of the steamer, the bird flew away a few yards and realighted. After a few moments halt on his second perch he again took wing and disappeared in the distance, but *did not fly toward land.* This bird had certainly flown twenty miles without rest, yet bore not the slightest evidence of fatigue.

That the exhausted refugee on the *Oceanic must* have flown a great distance the comparative condition of the two individuals proves. How great that distance was must remain a conjecture, but that it stretched away to the nearest windward land is, in my opinion, the only rational conclusion.—*H. E. Stockbridge, Sapporo, Japan, August 9, 1886.*

NOTES ON THE ZOOLOGICAL GARDENS AT ANTWERP AND LONDON.—The Zoölogical Gardens at Antwerp contain at present one great mammalian curiosity, the Anoa of Celebes, a creature something between an ox and an antelope. The gardens are tolerably rich in antelopes generally, also in carnivores. The series of cassowaries is more complete than that of the London Zoölogical Gardens, and there is a very full list of raptores.

The collection at Antwerp is really a fine one for the size of the city, only one-fourth that of Philadelphia, which with difficulty supports its "Zoo."

Both these gardens and those of London have an example of the Lycaon, or South African hunting-dog. The great attraction of the London Zoo is a young chimpanzee, var. tschego *(Simia calva)*, the first specimen of the species that has been taken alive. When caught she was two years old, and is now more than five. Lively, sly and full of fun, this young creature is quite a contrast to the usual listless ape of the menageries, and the great difference leads one to believe that idiosyncracy or ill-health, or a combination of the two, are the causes of the apathy so generally exhibited by man's nearest relatives when in confinement. This animal is as full of tricks as any of the smaller monkeys. She will play with visitors very gently until she has gained their confidence, and will then suddenly seize a hat, bonnet or other removable article. She is a particularly good ratter, but expects her keeper to assist her, calling ugh, ugh, to induce him to stop the rat's escape in one direction, so that she can catch it in another. This unsophisticated female child came from the Gaboon.

Cockroaches are exceedingly plentiful in the chimpanzee house of the London Zoo—they are not the vulgar native species, the black beetle of London homes, but emanate from the West Indies, whence they accompanied some more noble animal. In the warm atmosphere they live and multiply, though a severe frost kills many, and those who escape from their quarters fortunately perish. The keeper often catches some of these beauties for entomological enthusiasts.

In the same house with the chimpanzee are cages containing petaurists, rat-kangaroos, dasyures and other small marsupials, most of them, as is their habit, lying coiled up in a corner of their dwellings, and appearing as mere lumps of fur. In the bear house are two fine examples of the rare Tasmanian wolf (Thylacinus).

As in the gardens at Philadelphia, the heaviest animal is a rhinoceros. This *R. unicornis* weighs about three tons. The largest of the young elephants is but little less, and will grow seven inches in height yet. Jumbo's position is occupied by two young African elephants, whose united bulk would be far inferior to that of their gigantic predecessor. The London Zoo is

rather awkwardly situated and inconveniently shaped. It is almost a mile from the nearest railway station (Portland road, on the Metropolitan or Underground railway), and is divided into three unequal sections by a public road and a canal, the former crossed by means of a tunnel, the latter by a bridge. The reptile house, the bears, otters, seals, canines, pheasant and other bird paddocks, birds of prey, etc., etc., are in the largest division; on the other side of the road are the elephants, rhinoceros, giraffes and other large herbivores, many deer and antelopes, the marsupials, chimpanzee, edentates and parrots, while the insect house is beyond the Regent canal.—*W. N. Lockington.*

HUMAN CEREBRAL FISSURES, THEIR RELATIONS AND NAMES AND THE METHODS OF STUDYING THEM.[1]—In 1873 Professor Wilder read before the Amer. Association for the Adv. of Science a paper on the fissures of the Carnivora. Since that time he has prepared for the museum of Cornell University many human brains, fœtal as well as adult, and of several races; has examined nearly all the literature of the subject and published several papers on special points, the latest being "On the paroccipital, a newly recognized fissural integer" (Jour. of Nerv. and Mental Disease, June, 1886), and communications before the recent meeting of the Am. Neurol. Assoc. While far from satisfied on certain matters, since each fissure should be monographed, the conclusions now presented are, he believes, worthy of consideration. The study of the human fissures should be preceded by the study of the general characteristics of fissures upon some animal easily obtained at all stages of growth, and in which their arrangement is more simple. At present no help is gained from the attempt to refer the human fissures to a series of regular arches. The memorizing of their positions and names may be facilitated by regarding the cerebral surfaces simply as unexplored regions, and by learning certain fissures before others. The "*landmarks*" are the *mesal margin of the hemicerebrum*, the *callosum* and the *Sylvian fissure.* Accepting the usual division of each hemicerebrum into lobes, *occipital, temporal, parietal and frontal*, the last may be advantageously subdivided into *prefrontal and postfrontal* by a line continued from the presylvian fissure. The first fissures to be studied are the ten *interlobar: Sylvian, presylvian, central, circuminsular, callosal, occipital, hippocampal, exoccipital, preoccipital* and *preoccipital fovea*, the last three perhaps inconstant. Next the seven *constant, intergyral fissures with structural correlatives: basisylvian, olfactory, amygdaline, calcarine, collateral, postoccipital fovea*, and *lambdoidal* (not Owen's but one lately shown by Professor Wilder to be collocated in the fœtus with the lambdoidal suture). Third, the fifteen *constant, intergyral fissures, without struc-*

[1] Abstract of paper read before the A. A. A. S. at Buffalo, Aug., 1886, by Burt G. Wilder, M.D.

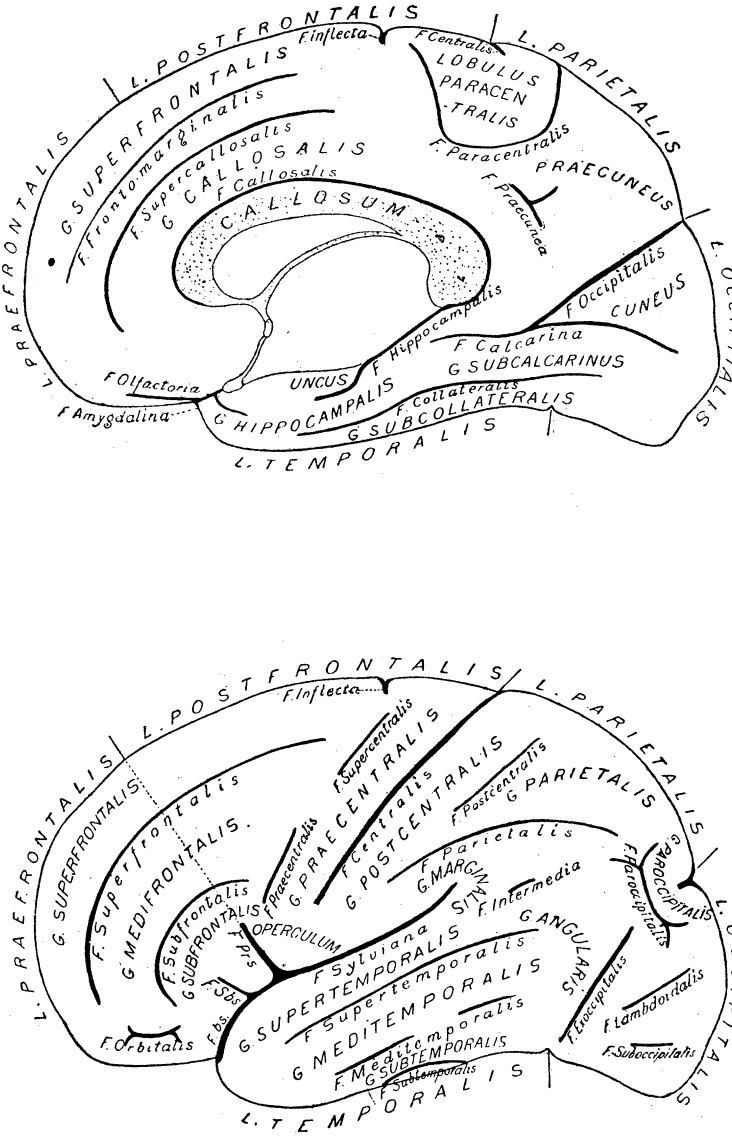
tural correlatives: Paracentral, paroccipital, supertemporal, meditemporal, subtemporal, subfrontal, superfrontal, insular, supercallosal, orbital, precentral, supercentral (dorsal part of precentral), *postcentral, parietal* and *precuneal.* Lastly the thirteen *intragyral, inconstant fissures: Adoccipital, inflected, fronto-marginal, postcalcarine, suboccipital, preparoccipital, postparoccipital, intraparacentral, medifrontal, intermedia, subsylvian, episylvian* and *hyposylvian.* Total, including the *sagittal* (*interhemicerebral*) forty-six, a larger number than before enumerated. The names are *mononyms,* selected or formed from names in common use or already proposed by some original investigator. Most of them imply either the relation of fissures to structural correlatives or their position relative to some main fissure. The same is the case with most of the gyral names, but a few have been correlated with the bordering fissures; *lingual* and *fusiform,* for example, are replaced by *subcalcarine* and *subcollateral.* The paper was illustrated by diagrams of the mesal and lateral aspects of the hemicerebrum, and by lists of the fissures grouped as above. Some of the fissures were discussed in detail, and the paper concluded with an expression of the belief that the common idea of the usefulness of the brains of monkeys as foundations for the study of human brain is erroneous, and that, contrary to the view and practice of Meynert, it is much better to examine fœtal brains at various stages of growth.

EXPLANATION OF PLATE XXIX.

The figures are diagrammatic, but based upon a very simple, adult, mulatto brain, No. 322 in the museum of Cornell University, and they probably represent an extreme degree of fissural independence.

The gyral names are in capitals. The fissural names are in italics and commonly placed just below the fissure lines. All the names on the figures are Latin, but the English paronyms are used in the text. The abbreviations *F. prs.*, *F. sbs.* and *F. bs.* stand respectively for the presylvian, subsylvian and basisylvian fissures. The *exoccipital* is Wernicke's fissure, or the occipitalis anterior of Schwalbe.

ZOOLOGICAL NEWS.—*Crustacea.*—Of the twenty-one bottom-inhabiting abyssal species of Decapoda enumerated by Mr. S. I. Smith, eight have normal black eyes, two have abnormally small eyes, three have eyes with purplish or very light-colored pigment and eight have eyes of doubtful function. Of the five species taken below 2000 fathoms one has well-developed black eyes, two have abnormally small black eyes, and one eyes of doubtful function. In spite of the objections of the physicists, our authority thinks it probable that some kind of luminous vibrations penetrate to depths exceeding even 2000 fathoms, at least in the pure waters of mid-ocean, though there is doubtless a tendency towards a radical modification of the eyes in deep water.——The large size and small number of the eggs is a marked characteristic of many deep-sea Decapoda, and in one case (*Bythocaris leucopis*) this has been proved by Professor G. O. Sars to be accom-



Human cerebral fissures.

panied by an abbreviated metamorphosis within the egg.——Sars, some years ago, claimed that the accessory eyes of Euphausia were luminous organs. This statement has just been confirmed by Mayer and Ghiesbrecht. Isolated and crushed with the cover-glass under the compound microscope, the thoracic eyes shone brightly, the light apparently proceeding from the bundles of rods. Another specimen was treated with aqua ammonia, when the so-called eyes appeared as so many points of light, the rest of the body remaining dark.

Brachiopods.—L. Joubin, in a somewhat detailed account of the anatomy of Crania and Discina (Arch. Zool. Expérimentale, II, IV, 1886) comes to the conclusion that the Brachiopods, though approaching more closely to the Polyzoa than to any other group in the animal kingdom, are to be regarded as "a class absolutely distinct and independent."

Reptiles.—At a meeting of the Royal Society of Tasmania it was stated that a black snake (*Hoplocephalus curtus*) four feet three inches in length, had been found to contain 109 young. Mr. Morton stated that the greatest number he had previously known to be taken from a similar snake was thirty-two, though he had heard of seventy from an allied species.

Birds.—*Nature* has, in a recent issue, given several examples of male birds caring for the eggs and young. One of these is that of a turkey cock which incubated six fowl's eggs and hatched three chickens, which he treated with all the care of a hen. He appears to have been moved to this act by the failure of his mate to raise offspring. The male ostrich, in a semi-domestic state, undertakes a large share, sometimes the whole, of the nidification. The male alone of the pair of Apteryx at the Zoölogical Gardens of London, sat upon the eggs, but his fifteen weeks assiduity produced no result. Another case is that of a bantam cock which brought up a brood of chickens the mother of which had died when they were two days old. The emu, according to Mr. A. Bennett's observations of birds bred by his father, begins to lay about the end of October, laying twenty or more eggs at intervals of two days. The male bird begins to sit before all the eggs are laid, the eggs laid subsequently being deposited by the hen beside her mate, who puts out his foot and draws them under him. When the eggs begin to hatch it is necessary to isolate the hen, who fights furiously with her mate, and to all appearance would kill the chicks if she could get at them. The whole of the tending of the young is performed by the male bird.

Mammals.—G. E. Dobson notes the presence, in the peculiar *Myosorex varius* Smuts., of South Africa, of a seventh very small mandibular tooth lying between the second and third teeth, and from the direction of the cusp apparently a lower canine. From this it would follow that the other shrews have no lower canines.

——One of the most startling of Dr. Paul Albrecht's homologies or rather homo-dynamies is that which he seeks to trace between the claspers of a ray and the penis or clitoris of a mammal, bird, etc. It is, he says, the two hemipenes or claspers united, and cases of epi and hypo-spadias are atavisms. The skeleton, muscles and nerves of this organ, according to Albrecht, belong to the extremities.—— Dr. C. Hartlaub has (Zoologischen Jahrbüchern, Band 1) given the results of an investigation of the specimens of manatees in various European museums. He fully establishes the specific difference between the African *M. senegalensis* and the American *M. latirostris*, and describes for the first time the skull of the South American *M. inunguis*, a species absolutely ignored by most naturalists, but the distinctness of which he proves. The African manatee inhabits the west coast of Africa from the Senegal to the Quanza, and penetrates far into the interior up the larger rivers. The "water sheep" spoken of by Schweinfurth in the Welle, and the supposed manatee found in Lake Tchad and the Shari by Barth and others, may prove to be another species. In America the exact boundaries between *M. inunguis* and *M. latirostris* cannot be certainly stated, on account of the confusion that has hitherto existed between these forms. But it is certain that the manatee occurs from 25° N. lat. to 19° S. lat., and that that of the Antilles, Gulf of Mexico and Surinam is *M. latirostris*. *M. inunguis* is only certainly known from the Amazon and its tributaries.

PSYCHOLOGY.

THE DREAMS OF THE BLIND.—A paper read before the biological section of the American Association for the Advancement of Science was on "The Dreams of the Blind," by Dr. Joseph Jastrow. The object of the paper was to determine the extreme age at which a child may become blind and yet lose all memory of the visible world, so that it no longer sees in its dreams.

Almost all dreams of normal persons are sight-dreams, and a dream is often spoken of as a vision. The blind are deprived of this most important sense; but if they have not been born blind they may remember enough of what they have seen to enable them to imagine how things look, and when the imagination has free play in sleep to picture themselves as in full possession of all their senses. Physiologists would explain this by saying that during the years in which they saw, a certain part of the brain has become educated to receive and interpret all these messages which the eye sends, and that when this part of the brain acts spontaneously in sleep the person dreams of seeing. Such a portion of the brain would be called the sight center.

If now we find out the latest age at which blindness may set in and yet the person keep on dreaming of seeing, we will find out the time it takes for this sight center to develop. For this pur-